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AUTHOR McClory, Susan
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ABSTRACT

This paper reports on the problem of disproportionately high remediation rates among African-American and Mexican American college students in the California State University (CSU) system. In response to this need, it is reported that CSU began a program of having incoming students complete any necessary remedial courses within their first year of study. The implementation of this program at San Jose State University beginning in 1988 is reported. Structural changes including curriculum change within the university and outreach programs to local schools are discussed. (MM)

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MATHEMATICS REMEDIATION IN THE CALIFORNIA STATE UNIVERSITY SYSTEM: ONE CAMPUS' APPROACH

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Remediation or developmental education has become a hotly debated topic in higher education. Will universities close their doors to students who are underprepared? Will the community colleges be able to accommodate those who are turned away?

There is no simple answer to why a student enters college without having the prerequisite skills. There is also no simple answer as to how to address their needs. What we do know is that the problem seems to be most critical with our minority students. A look at the remediation rates by ethnicity for the California State University (CSU) system over the past few years shows that the ethnic group with the highest percentage of students requiring remediation in mathematics is African American followed closely by Mexican American and non-Mexican Latino. While we saw a six to seven point improvement in these rates in 1999, they are still well above the rate for white students.

Before universities turn these students away and send them to community colleges, consideration must be given to the likelihood of these students finding their way back to the university. In California, the transfer rate for minority students from community colleges to the CSU has been disproportionately low. While community colleges are perhaps better designed to address the needs of remedial students, there is an advantage that a University has that a community college can't offer. That advantage is that they can offer a residential experience to students who come from environments that are not necessarily conducive to learning. The immersion in an academic setting offered by a residential program can have a positive impact on retention rates.

In response to the overwhelming need for remediation, the California State University system has embarked on an aggressive program of having incoming students complete any necessary remedial courses within their first year of study. In addition, each campus has been charged with the task of reducing the need for remediation to 10% by the year 2007. Each campus has devised a plan for testing, advising, placing and remediating these students as well as outreach programs to local K-12 schools in an effort to reduce future need.

In 1995, the CSU Board of Trustees passed a resolution affecting remediation of incoming students systemwide. Each of the system's 23 campuses was required to come into compliance with this resolution, known as Executive Order 665, no later than the fall of 1998. Executive Order (EO) 665 calls for each campus to deal with underprepared students in a timely manner while working toward reducing the need for remediation over a period of years. Each campus has devised its own plan for addressing these issues, but all of the campuses face similar difficulties.

In preparation for EO 665, statewide meetings were hosted by San Jose State University in 1997 and 1998. These meetings brought together a wide range of people involved in the implementation of the order. At the first meeting in fall of 1997, administrators, department chairs and program directors met with the focus on "how are we going to do this?" This one day meeting brought together some of the most creative problem solvers

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the system has to offer. Many ideas were shared, but even more unanswered questions went home with the participants. Many support networks were forged during this first meeting. During the year prior to implementation, the sharing of ideas and concerns became common not only on each of the campuses, but also between campuses.

In the fall of 1998, a follow-up meeting was held to bring the participants back together to discuss what lessons had been learned during the first year of implementation. This meeting focused on problems that had surfaced that were not previously anticipated and the methods used by each campus to address them. From this meeting, listserves for math and language program coordinators emerged to facilitate ongoing collaborations.

The first requirement set down by EO 665 that each campus was forced to deal with is the timely addressing of incoming students' remedial needs. The order mandates that every non-exempt, regularly admitted incoming student must take the English Placement Test (EPT) and the Entry Level Mathematics (ELM) test prior to enrolling in classes. Those who fail either test are then required to enroll in the necessary remedial "activity" to address the deficiency during the first semester of attendance. Further, each student is required to satisfy any deficiencies within the first year or be subject to disenrollment from the university.

In 1998, the first year of systemwide compliance, approximately three-fourths of the incoming freshling class were not exempted from the placement tests and needed to be tested prior to enrollment. After being tested, the CSU saw 54% of its incoming freshlings in need of remediation in mathematics. Each campus had to insure that these students were appropriately placed before the fall semester began. In addition, a considerable amount of effort was spent on educating these students regarding EO 665 and its impact on them.

At San Jose State University, the impact of EO 665 was significant. Even though the placement tests have been in existence since 1983, requiring all non-exempt incoming students to take them and immediately address their remedial needs caused a tremendous increase in enrollment. The MathCS department saw its Developmental Math enrollments increase from 843 in the fall of 1997 to 1393 in the fall of 1998 with an increase in the number of sections from 34 to 69.

To prepare for this, projections were made and additional class sections were included in the fall 1998 schedule. Many new adjunct instructors had to be recruited, hired and trained. Suddenly, administering the Developmental Math program became a full time, year round assignment. Advising of students and hiring of faculty now takes up much of the summer for the coordinator.

Non-exempt entering students are placed solely on their ELM score. The test consists of sixty-five multiple-choice questions, of which sixty are scored. The remaining five questions are being pretested for possible future use on the test. One hour and fifteen minutes is allotted to take the test. Problems on the test are approximately 60% algebra, 20% geometry, and 20% data interpretation, counting, probability and statistics. The test is scored on a scale of 100 - 700. The passing score is 550, roughly equivalent to a score in the range of 35-39 correct out of 60 questions. Students are now allowed to use calculators on the test.

In preparation for the new requirements, the Developmental Math program at San Jose State University underwent dramatic restructuring. Despite their level of preparedness, all students entering the CSU underprepared in Math and who are subject to EO 665 must complete intermediate algebra within their first year. To assure that students had the best possibility of doing this, the curriculum was rewritten around a combined introductory and intermediate algebra syllabus. This was done to eliminate the amount of repetition of introductory algebra topics found in a typical intermediate algebra course. It also allows students in the lower levels to spend more time mastering each of the topics.

Students scoring in the lowest quartile, with ELM scores of 370 or less, are placed into a special program known as the Intensive Learning Experience (ILE). These students cover the combined curriculum over two semesters. Each section has an enrollment of about 25 students who meet with their instructors four days each week.

Students in the mid range, with ELM scores between 380 and 450, also cover the curriculum over two semesters. However, these students meet twice each week in a large lecture section of approximately 200 students and twice each week in small group discussion sections of approximately 25 students each.

Students who fail the ELM with a score of 460 or more cover the entire curriculum in one semester. Those with scores between 460 and 490 meet three days each week in a large lecture section and two days each week in small group discussion sections. A new program of independent study was introduced in 1998 for students with scores of at least 500 as an option to the five day a week class.

The independent study program is a five-unit course with no set meeting time. Students are given study materials and practice problems that cover ten topics from algebra. Once a student has reviewed the material and feels ready, a test on that material is taken. If a student fails to earn 70% on the test, further study is required and the test must be retaken in a different version. In order to receive credit for the course, all ten tests must ultimately be passed at the mastery level of 70%.

In addition to the internal changes that were made to the program, plans for testing, advising and enrolling students were implemented in anticipation of compliance with EO 665. A considerable amount of effort went into making sure that students were properly placed in classes for the fall 1998 semester. Because of the mandatory nature of the remedial courses, students were blocked from registering for other classes until they registered for any required remedial courses during a series of advising days. The automated registration system also blocked students from dropping a remedial course without dropping all of their courses.

Once the curricular changes were made and additional sections were added to handle the anticipated flood of remedial students, the SJSU campus set out to make sure that the students entering in the fall of 1998 were tested, advised and enrolled in a timely manner.

The first step was to offer additional dates for the two placement tests. Instead of the traditional four or five dates annually, a test session was offered at least once a month from February through August. Since students can only take the tests after they've been admitted, this meant that the admissions office was under considerable pressure to admit applicants as quickly as possible. Only by doing this would the campus be able to begin testing students in February and begin the advising and registration process in May.

As students were admitted, they were informed as to which of the tests, if any, they were required to take. Attendance at an Orientation and Advising program was made mandatory for all incoming freshlings. Students were not allowed to attend one of these until their test scores were available and no incoming freshling was allowed to enroll for classes until they attended a program.

When a student attended an Orientation and Advising program, half of the day was spent in orientation and half in academic advising. During the advising session, students met with an advisor from their major or a GE advisor if they had not declared a major. During these sessions, students received a matrix of courses that they should take based on their major and their placement test scores. These matrices made placement of students more efficient and effective. For example, a student who had not passed the writing test would not be placed into a GE course that required much writing. And, likewise, a student who failed the math placement test would not be placed into economics or a science that required considerable math skills.

Once the students received the appropriate matrix, they worked out a proposed schedule for the fall with the help of the advisor. They then took it to the registration area where they were enrolled in their classes. This system worked well as long as there were sufficient sections of classes remaining open. By mid summer, however, the whole process began to bog down as classes filled.

Once the fall semester began, the immediate problem turned to schedule adjustments. Because all classes would be dropped if a remedial class was dropped, students could not switch sections of a remedial course on their own. Therefore, a centralized location was established for Developmental Mathematics registration in the Mathematics Achievement Center. Because students could only add, drop or switch their classes at this location, proper placement could be insured and enrollment numbers could be managed.

Once the program adjustment period ended, attentions turned to academic tracking of students subject to BO 665. Each instructor reported those students who were not maintaining a passing average following each exam. These students were then contacted by the coordinator and invited to come in to the Mathematics Achievement Center for free tutoring. These students were also reminded of the requirement to complete the program within one year and were counseled as to their options.

The final hurdle to clear during the first fall semester of compliance was how to handle spring placements. With registration for spring classes taking place before the end of the fall semester, there needed to be a plan as to how to handle the EO 665 students. Since the computerized registration system blocks these students from registering for any other classes until they are registered for their required remedial course, it was important to determine a student's spring placement as soon as possible. But, since the fall semester was not over yet, where would these students be placed?

It was decided that all students would be automatically registered for the next developmental course in the sequence, thus opening them up to register via telephone for their other classes. They were also told that their schedule would be automatically adjusted if they failed to pass their first semester class and that they should check their schedule after grades were posted.

This was a major lesson learned during the first year. A significant number of students who failed the first semester course never bothered to check their schedule once grades were posted. This meant that many of them began the second semester by attending classes from which they had been dropped and failing to attend the correct class. Each of these students had to be identified once the spring semester began. This process proved to be very confusing for the student, the instructors, and the staff. The next year, students were asked to request their choices for the next course in the sequence if they passed as well as a review course if they failed. They were not given schedules before they left for winter break. Instead, they were told to call in for their schedule after a certain date and then register for their other classes.

A decision had to be made at the end of the first semester regarding the placement of students who failed the first of a two-course sequence in the fall. Since they had only one semester left in which to complete two semesters of work, something had to be done. It did not seem practical to place these students into the large lecture hall class that covered the entire curriculum after they had already failed the first half.

A decision was made to designate certain sections of the second semester ILE course as "review" sections. Students in these sections were to review the material covered in the first semester and then continue on through the second semester work. Since these students had already failed half of the material, they were at high risk of failing again. The results for these students during that first spring semester bore this out. In the spring of 1999, only 28% of the students enrolled in these "review" classes passed.

To better address the needs of these students, a new course is being introduced in the spring of 2001. This course will be similar to the review sections previously offered with two major changes. First, the class will meet five days per week rather than four. But the major change is that the concept of mastery learning will be introduced. A set of chapter tests in multiple versions has been created and will be used by all sections. Students will be required to pass each of the ten tests at a mastery level of 70%. Students who fail to earn 70% on any test are referred to one of two tutorial centers for further assistance and then given the opportunity to retake the exam no more than twice. Students who fail to achieve mastery on each of the tests may take a comprehensive final exam at the end of the semester. Scoring at least 70% on this exam will allow them to earn credit.

In the spring of 1999, it was becoming obvious that many students were not going to be able to complete the requirements by the end of the spring semester. Summer school was the only hope for these students to return to the university. Since summer session at SJSU is self-supporting and costs $155 per unit, a more cost-effective alternative was sought. The answer came in the form of a cooperative venture with one of the local community colleges. Students were able to take their SJSU Developmental Math course on the university campus, from a university instructor while being enrolled at the community college. The entire tuition cost was $67.50 that first summer and went down to $50 the second year.

That first summer, there were 157 students who took advantage of this program. Of those students, 67 were incoming freshlings and 64 were students who had just completed their first year. The rest were students who had been at the university for more than a year or were considered "special" admits and thus were not subject to EO 665.

The results were not surprising for the students who had just completed their first year at the university. These students were enrolled because they had to make up for a failing grade in one or both of the previous semesters in order to be allowed to return in the fall. Only 17 (27%) of the 64 students facing disenrollment passed during the summer and returned to class in the fall. The somewhat surprising result was for the incoming freshlings. A total of 63 of them, or 94%, passed the summer class and either moved to the second semester course or cleared remediation completely.

This program was repeated in the summer of 2000. This time, a total of 178 students completed the program, of which 94 were incoming freshlings and 52 had just completed their first year. The entering students passed at nearly as good a rate as they had done during the first summer. A total of 86 (91%) of these students passed and continued on to the second semester course or completed their remediation. There was a significant improvement in the pass rate for the continuing freshlings, however. This time, 22 (42%) of the 52 students passed and were allowed to return in the fall.

The only curriculum change that was made was that several sections of the second half of the two-semester course were offered. During the first year, only the first half of the two-semester course and the complete one-semester course were offered. Therefore, students who passed the first half of the course and failed the second were forced to retake the entire course during the summer, which was more difficult.

The fate of the summer program is currently unknown. There are two changes that have recently occurred that will affect its future. The first of these changes is that, beginning with the students who enter in 2001, they will have only until the following May to complete their remediation. If we continue to offer the courses through the community college, the only impact this would have on students is that students who have already completed two semesters would not be able to register for their fall classes until they successfully completed the summer course.

But there is another change that may jeopardize this opportunity. The CSU has recently decided to convert to year-round operation. The University's summer program will now be state supported and students will register for it just as they would a regular semester.

Because of this, it is unknown if we will be able to continue offering courses through the community college during the summer. Not only would this mean that the summer classes would cost students significantly more, but those who have been disenrolled in May would be unable to register for them.

Now that it has been two years since the CSU system came into compliance with BO 665, it is possible to look back at how students performed. The data for the first freshling class under full compliance shows that, one year after entering the CSU in fall of 1998, 79% were fully proficient in both math and English. An additional 7% were granted a one-semester extension on the time limit to complete one area of remediation. These extensions will be significantly curtailed in the future.

A total of 14% left the CSU system unremediated after one year. These students are told to take an Academic Leave of Absence and complete their remediation at a community college. Once these students have successfully completed intermediate algebra (and/or English 1A if required) they can return to the university without reapplying.

At the same time that campuses were struggling with increased enrollments in remedial programs and all of the necessary bureaucratic changes that needed to happen to comply with EO 665, each campus was also dealing with the second part of the order.

In addition to requiring timely completion of required remediation, Executive Order 665 also charges each of the CSU campuses with devising a plan to reduce the need for remediation in incremental steps. The order calls for there to be a 10% reduction in the need for remediation by the fall of 2001, a 50% reduction by the fall of 2004 and a reduction to 10% of incoming students by the fall of 2007.

In an attempt to reduce the need for remediation, each campus has forged some type of partnership with local K-12 schools. In addition, the Chancellor's Office has identified 223 high schools that provide the CSU with the highest number of remedial students. Special efforts are being made to engage those schools in partnerships. In 1999, a total of $9 million was sent from the Chancellor's Office to campuses to enhance partnerships with 157 of these schools. Additional money has just recently arrived on campuses to extend these efforts for another year.

Some of the activities the campuses are involved in with local schools include inservice training to clarify and align CSU and school standards, developing more effective English and math teaching methods, administering and interpreting diagnostic tests and training CSU student tutors to work with high school students. There are many more singularly commendable efforts ongoing at various campuses.

The California State University system will be watched very carefully over the next few years to see how its efforts pay off. Critics will be looking for negative impacts on enrollments or on diversity while institutions with similar problems will be looking for glimmers of hope in the search for answers. But, until the need for remediation is brought under control, the California Community College system is going to be forced to deal with the increased enrollments caused by students disenrolled from the CSU.